CLAIMS

1. A solid catalyst component for the polymerization of olefins comprising Mg, Ti, a halogen and an electron donor compound (ED) belonging to ethers, esters, amines, ketones, or nitriles, characterized in that the molar ratio Mg/Ti is higher than 5, and the molar ratio ED/Ti is higher than 3.5.
2. The solid catalyst component according to claim 1, in which the ED compound is selected from the group consisting of ethers, esters and ketones.
3. The solid catalyst component according to claim 2, in which the ED compound is selected from the C2-C20 aliphatic ethers.
4. The solid catalyst component according to claim 3, in which the ethers are cyclic ethers.
5. The solid catalyst component according to claim 4, in which the cyclic ethers have 3-5 carbon atoms.
6. The solid catalyst component according to claim 5, in which the cyclic ether is tetrahydrofurane.
7. The solid catalyst component according to claim 2, in which the ED compound is selected from the alkyl esters of C1-C20 aliphatic carboxylic acids.
8. The solid catalyst component according to claim 7, in which the ester is selected from C1-C4 alkyl esters of aliphatic mono carboxylic acids.
9. The solid catalyst component according to claim 8, in which the ester is ethylacetate.
10. The solid catalyst component according to claim 1, in which the ED/Ti molar ratio ranges from 3.7 to 40.
11. The solid catalyst component according to claim 1, in which the ED/Ti molar ratio ranges from 4.5 to 30.
12. The solid catalyst component according to claim 1, in which the Mg/Ti molar ratio ranges from 7 to 120.
13. The solid catalyst component according to claim 1, in which the Mg atoms derive from $MgCl_2$.
14. The solid catalyst component according to claim 1, in which the titanium atoms derive from titanium tetrahalides or the compounds of formula $TiX_n(OR^1)_{4-n}$, where $0 \leq n \leq 3$, X is halogen and R is C_1-C_{10} hydrocarbon group.
15. A catalyst for the polymerization of olefins comprising the product obtained by contacting:

(a) a solid catalyst component according to anyone of the preceding claims;

(b) one or more aluminum alkyl compounds and, optionally,

(c) an external electron donor compound.

16. The catalyst according to claim 15, in which the aluminum alkyl compound is an Al trialkyl.

17. The catalyst according to claim 15, in which the aluminum alkyl compound is an aluminum alkyl halide.

18. The catalyst according to claim 15, in which the aluminum alkyl compound is the product obtained by mixing an Al trialkyl compound with an aluminumalkyl halide.

19. The catalyst according to claim 15, in which the external electron donor compound is a C2-C20 aliphatic ether.

20. The catalyst according to claim 19, in which the ether is tetrahydrofurane.

21. The catalyst according to claim 15, in which the external electron donor compound is a silicon compound of formula $R_a^5R_b^6Si(OR^7)_c$, where a is 0, c is 3, R^6 is a branched alkyl or cycloalkyl group, optionally containing heteroatoms, and R^7 is methyl.

22. The catalyst according to claim 15, which is obtained by pre-contacting the components (a), (b) and optionally (c) for a period of time ranging from 0.1 to 120 minutes at a temperature ranging from 0 to 90°C.

23. The catalyst according to claim 22, in which the pre-contact is carried out of in the presence of small amounts of olefins, for a period of time ranging from 1 to 60 minutes, in a liquid diluent, at a temperature ranging from 20 to 70°C.

24. The catalyst according to claim 15, which is pre-polymerized with one or more olefins of formula CH_2=CHR, where R is H or a C1-C10 hydrocarbon group, up to forming amounts of polymer from about 0.1 up to about 1000 g per gram of solid catalyst component (a).

25. A process for the (co)polymerization of olefins CH_2=CHR, wherein R is hydrogen or a hydrocarbon radical having 1-12 carbon atoms, carried out in the presence of a catalyst according to one or more of claims 15-24.

26. The process according to claim 25, for the preparation of an ethylene/alpha olefin copolymer having a content of alpha olefin ranging from 0.1 to 20% by mol.

27. The process according to claim 26, characterized in that it is carried out in gas-phase.

28. The process according to claim 27, characterized in that it is carried out according to the following steps:

(i) contacting the catalyst components (a), (b) and optionally (c) for a period of time ranging from 0.1 to 120 minutes, at a temperature ranging from 0 to 90°C; optionally

(ii) pre-polymerizing with one or more olefins of formula CH_2=CHR, where R is H or a C1-C10 hydrocarbon group, up to forming amounts of polymer from about 0.1 up to about 1000 g per gram of solid catalyst component (a); and

(iii) polymerizing in the gas-phase ethylene, or mixtures thereof with α-olefins CH_2=CHR in which R is a hydrocarbon radical having 1-10 carbon atoms, in one or more fluidized or mechanically stirred bed reactors, in the presence of the product coming from (i) or (ii).